Ten-Year State Highway System Rehabilitation Plan
1998-99 through 2007-08
and
Recommendation for Funding within the
1998 State Transportation Improvement Program
Fund Estimate

February 1, 1998

Prepared by Department of Transportation
Maintenance and Transportation Programming

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INTRODUCTION:

Senate Bill 45 (Kopp) became effective January 1, 1998. Under Streets and Highways Code Section 164.6, the Department of Transportation is required to prepare and transmit to the Governor and Legislature a 10-year state rehabilitation plan for the rehabilitation and reconstruction of all state highways and bridges owned by the state. The plan is to be submitted to the California Transportation Commission for review and comments, and is to be the basis for the department's budget request and for the adoption of the State Transportation Improvement Program (STIP) Fund Estimate.

Streets and Highways Code Section 167, mandates that the operation, maintenance and rehabilitation of the state highway system is the first priority for use of state highway account funds. Government Code Section 14526.5 indicates that expenditures for the State Highway Operation and Protection Program (SHOPP) are for major capital improvements needed to preserve and protect the state highway system. This 10-Year State Highway System Rehabilitation Plan has been developed to address all of the program elements included in the SHOPP.

The SHOPP is submitted, not later than January 31 of each even-numbered year, to the California Transportation Commission (CTC) for review of the program, level of funding needed and impact of the proposed expenditures on the State Transportation Improvement Program (STIP). The CTC is to approve the SHOPP and submit the program to the Legislature and Governor by April 1 of each even-numbered year.

During the July 1996, and the January 1997 CTC meetings, workshops were conducted to discuss the program components within the SHOPP. The workshops were augmented by two additional presentations on longer-life pavement during the October 1996 and March 1997 CTC meetings.

As required by Statutes, the Department has developed a 10-Year SHOPP Rehabilitation Plan as a basis for the SHOPP funding recommendation for the 1998 STIP Fund Estimate. The Plan will be updated every two years to confirm or revise future SHOPP recommendations for the Fund Estimate and the department's budget request.

FINDINGS:

- The existing transportation system has an estimated worth of $300 billion. It took 100 years to build the system, and rehabilitation needs currently exist statewide. (See Attachment 1).

- Annual vehicle miles traveled (VMT) on the state highway system have increased from 139 billion in 1990, to 146 billion in 1995, and is projected to increase to 186 billion by the year 2005.

- The increased VMT results in a faster rate of pavement deterioration, new accident concentration locations, and increased hours of traffic congestion.

- The 1995 State Of The Pavement Report indicated that of the over 49,000 lane miles of state highways, over 14,000 were in need of corrective maintenance or rehabilitation with approximately 4,300 requiring immediate attention to avoid further damage or loss of the facility. This immediate need is more than double the 2,000 lane miles identified in the 1992 report.

- The system is aging. Over 50% of the state highway bridges are over 30 years old. An increasing number are reaching the age where major rehabilitation or replacement will be required.

- The 10-Year SHOPP Rehabilitation Plan is intended to identify system needs, and recommend a long term investment/management strategy to effectively protect the public's investment in the state highway system.

Recommended 10-Year SHOPP Rehabilitation Plan

The 1996 STIP Fund Estimate is considered to be a baseline for SHOPP funding purposes. By extending the 1996 Fund Estimate to cover the ten-year period through 2007/08, the baseline provides $7.3 billion for SHOPP purposes. The recommended funding during this ten-year period is $8.6 billion or an increase of $1.3 billion over the 1996 Baseline. Below the 10-Year SHOPP Rehabilitation Plan recommendation is compared to the 1996 Baseline.

- 1996 Baseline:
  - reduction of deteriorated pavement to 5,500 lane miles.

- 10-Year Plan includes the 1996 Baseline plus:
  - additional funding for safety,
  - approximately 1,800 lane miles of longer-life pavement,
  - increased future funding for bridge rehabilitation,
  - increased funding for roadside rehabilitation, maintenance worker safety and compliance with codes at existing roadside rest areas,
  - additional operations funding to improve traffic flow, improve commercial vehicle enforcement, and comply with codes at state operations sites.

Projects in the SHOPP have been grouped into four categories: Traffic Safety, Roadway Rehabilitation, Roadside Rehabilitation, and Operations. Funding needs are escalated at 2.2% per year.

1998 STIP FUND ESTIMATE :

The 1998 STIP Fund Estimate is required to be a *six*-year estimate of all federal and state funds reasonably expected to be available in each county for programming in the STIP. In order to make this determination, it is necessary to establish the programming required for SHOPP purposes during this *six*-year period (1998-99 through 2003-04). The annual distribution of funds by category is shown in Attachments 4 and 5.

SUMMARY OF COSTS:

	6-Year Fund Estimate - Millions		10-Year Plan - Millions	
Category	Baseline	Recommendation	Baseline	Recommendation
Traffic Safety	$344	$399	$587	$659
Roadway Rehab	3,013	3,740	5,524	6,517
Roadside Rehab	154	243	267	410
Operations	503	620	875	1,054
Totals	$4,014	$5,002	$7,253	$8,640
Increase over Baseline	0	$988	0	$1,387

SUMMARY OF ECONOMIC BENEFITS:

Category	10-Year Funding Recommendation Millions	Economic Benefits Millions	Benefit to Cost Ratio
Traffic Safety	$659	$6,590	10:1
Roadway Rehabilitation	6,517	24,350	4:1
Roadside Rehabilitation	410	820	2:1
Operations	1,054	3,372	3:1
Total	$8,640	$35,132	4:1

Traffic Safety

MANAGEMENT STRATEGY:

Goal: Reduce the number and severity of accidents.
The fatal-plus-injury accident rate has decreased from 0.40 to 0.36 fatal-plus-injury accidents per million vehicle miles of travel since 1991. The goal is to continue this declining trend.

Traffic safety projects are designed to reduce the number and severity of accidents. Based on the number of predicted traffic safety projects, the recommended funding for safety will result in 350 to 400 fewer fatal accidents per year (lives saved, fewer injuries, reduced property damage and cost).

- Traffic Safety Projects: Approximately 6,800 accident locations are investigated each year. About 35% of these locations require some correction. Corrections are accomplished by: maintenance work orders, minor projects, SHOPP safety projects and at times incorporating an improvement with a STIP project. SHOPP safety projects provide a highway improvement at all locations where the benefit/cost ratio is greater than 2.0 (i.e. Safety Index greater than 200). In the past about 80 SHOPP safety projects have been completed each year.

- Median Barriers: Install concrete median barrier to replace metal median barriers on high volume urban freeways; and, construct new barriers on freeways based on traffic safety warrants to eliminate cross median accidents. About 45 miles of existing median barriers need to be replaced and 600 miles of new median barriers need to be installed. It is planned to install 400 miles of the new median barriers by 2002-03.

- Two and Three-Lane Roads: Implement a new barrier component established by the Department to reduce the number of fatalities on two and three-lane state highways. Locations qualifying for improvements must meet specific criteria. About 450 miles of two and three-lane roads are expected to be improved during the 10-year period.

- CURE Projects: Continue Clean Up the Roadside Environment program projects to remove or shield obstructions near the traveled way. The Federal Highway Administration has requirements to upgrade traffic safety devices and this will be accomplished through the CURE component. Over the next three years there is $11 million for CURE projects. This will fund 12 projects per year to correct deficiencies.

SUMMARY OF COSTS:

	6-Year Fund Estimate - Millions		10-Year Plan – Millions	
Traffic Safety	Baseline	Recommendation	Baseline	Recommendation
Traffic Safety	$312	$154	$528	$270
Median Barriers	32	96	59	165
2 & 3 Lane Roads	0	65	0	106
CURE	*	84	*	118
Totals	$344	$399	$587	$659
Increase over Baseline	0	$55	0	$72

* Included with Traffic Safety Projects

ECONOMIC BENEFITS:

The 10-Year Traffic Safety economic benefits for the recommendation are estimated to be $6.6 billion which results in a benefit to cost ratio of 10:1. These benefits are based on the expected reduction in the number of traffic accidents and their associated costs over an assumed 15 year project life.

Roadway Rehabilitation

MANAGEMENT STRATEGY:

Goal: Reduce deteriorated pavement needs. The state highway system has over 15,000 centerline miles, with over 49,000 lane miles. The 1995 State of the Pavement Report indicated that 14,100 lane miles (29% of the system) requires corrective maintenance or rehabilitation, with 4,300 lane miles needing immediate rehabilitation. Immediate rehabilitation needs have more than doubled from the 2,000 lane miles identified in the 1992 State of the Pavement Report. Reducing the inventory of deteriorated pavement to about 5,500 lane miles and maintaining it at that level will allow the Department to maintain and rehabilitate the system at the lowest overall annual cost. The recommendation provides for increased funding for projects through 2007-08, which will accelerate reduction in the inventory of deteriorated pavement to 5,500 lane miles (Attachment 3).

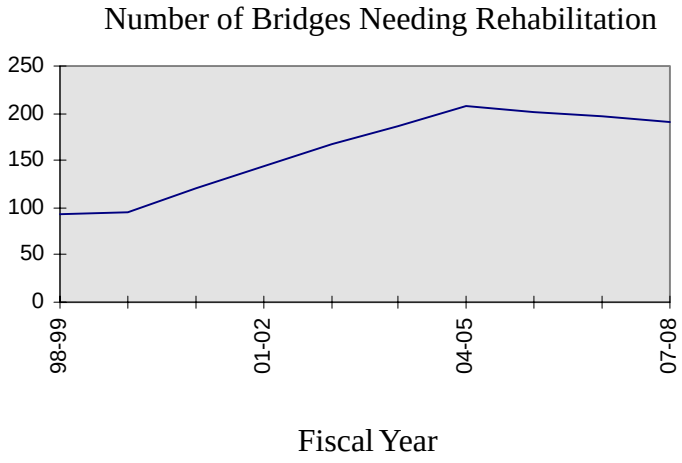
Goal: Switch from "worst-first" to "preventive treatment" management strategy.
Many pavement rehabilitation projects are currently programmed using a worst-first management strategy. Increased funding for pavement rehabilitation has allowed the Department to implement a preventive treatment management strategy. The change from "worst-first" to emphasis of "preventive treatment management strategy" is motivated by:
a) initiation of Capital Preventative Maintenance (CAPM) strategies in the 1995-96 fiscal year,
b) adoption of a long-term performance goal, and
c) the implementation of benefit-cost analysis at the highway network and project selection level within the Pavement Management System.

Changing from worst-first to preventive treatment management will reduce rehabilitation cost by up to 10 percent (Attachment 2).

Goal: Use longer-life pavement rehabilitation on roadways where the average daily traffic is greater than 150,000 or average daily truck volume is greater than 15,000.
During the March 1997 CTC meeting, the longer-life pavement presentation identified average daily traffic and truck volume thresholds where longer-life pavement provides high user benefit and the most cost effective rehabilitation strategy. The recommended funding level provides for implementation of longer-life pavement beginning with the 1998-99 fiscal year. During the 10-year period it is planned to fund construction of 1,800 lane miles of longer-life pavement.

Goal: Failure avoidance through preventative treatment management.
Over half of the nearly 12,000 bridges on the state highway system are over 30 years old. The cost for rehabilitation or replacement of these bridges is expected to increase as the bridges get older. Using the Department's bridge management information system, PONTIS, preventive treatments may be scheduled at the optimum point in time to defer major rehabilitation and replacement costs. Analysis of potential critical bridge scour

problems has begun and corrective work is scheduled over a 10-year period beginning in 1998-99. As the bridges get older, it is anticipated rehabilitation costs will increase from $100 million per year to about $300 million per year in 2004-05.



Pavement rehabilitation projects protect the public's investment, repair major structural problems, reduce the magnitude of maintenance effort and cost, optimize pavement life, reduce the "wear-and-tear" to vehicles operated on the state highway system, and allow the switch to a preventive treatment management strategy.

Bridge rehabilitation and replacement projects have benefits similar to pavement rehabilitation projects. Bridges provide a critical function to cross rivers, canyons, and other transportation facilities. Due to high replacement cost and the significant travel and economic impacts caused if they fail, it is paramount to keep bridges in a good state of repair.

SUMMARY OF COSTS:

	6-Year Fund Estimate, Millions		10-Year Plan, Millions	
Roadway Rehab	Baseline	Recommendation	Baseline	Recommendation
Pavement Rehab	$2,204	$2,276	$3,866	$3,299
Longer-Life Pvmt.	0	493	0	1,051
Bridge Rehab	809	971	1,658	2,167
Totals	$3,013	$3,740	$5,524	$6,517
Increase over Baseline	0	$727	0	$993

ECONOMIC BENEFITS:

Roadway Rehabilitation economic benefits for the 10-year funding recommendation are estimated to be $24.4 billion which result in a benefit to cost ratio of 4:1. These benefits include:

SUMMARY OF ECONOMIC BENEFITS:

Category	10-Year Funding Recommendation Millions	Economic Benefits Millions	Benefit to Cost Ratio
Pavement Rehab	$3,299	$13,031	4:1
Longer-Life Pavement	1,051	5,251	5:1
Bridge Rehab	2,167	6,068	3:1
Total	$6,517	$24,350	4:1

Pavement rehabilitation benefits were based on reduced construction, vehicle operating and delay cost if rehabilitation projects are in the 10-Year funding recommendation.

Longer-life pavement benefits include a reduction in delays caused by conventional rehabilitation, savings to the department for long life versus conventional rehabilitation costs and a reduction in pavement maintenance costs. Benefits were based on life cycle costs over the 35 year life of the projects.

Bridge rehabilitation benefits were based on the life cycle cost benefits of using preventive treatment strategies versus worst first selection of projects.

Roadside Rehabilitation

MANAGEMENT STRATEGY:

Goal: Keep mitigation promises.
Commitments made during environmental clearance for roadside planting need to be kept.

Goal: Reduce worker exposure to traffic.
Strategically placed pull outs and automated irrigation systems are examples of improvements that reduce worker exposure to traffic and improve safety.

Goal: Existing safety roadside rests must comply with health and safety codes & ADA.
The 89 existing safety roadside rests need to be safe and meet current code requirements.

LANDSCAPE ELEMENT:

There are over 22,700 acres of existing landscaping in the state highway system. Most of the landscaping represents commitments made during environmental clearance to mitigate for erosion control or aesthetic impacts. The 10-year SHOPP projects will result in water conservation, maintenance worker safety and efficiency, reduced soil erosion and satisfy mitigation commitments made prior to 1987 for new landscaping at 15 locations.

The Landscape element in the 10-Year SHOPP Roadside Rehabilitation component includes:

- Sprinkler Systems: The Department has 2,900 acres of landscaping that are irrigated by manual sprinkler systems. Installation of automatic systems will reduce water use by 40%, reduce maintenance, and increase worker safety by reducing their exposure to traffic. The goal is to have all of the manual irrigation systems upgraded to automatic systems by 2008 except those included with the rehabilitation projects.

- Planting Rehabilitation: There are about 9,000 acres of landscape that are near or over 20 years old, the age that major maintenance or rehabilitation is usually needed. With proper maintenance, approximately $300 million provides for these needs over the next 20 years. Rehabilitation will improve roadside appearance, reduce the use of herbicides, reduce water runoff, reduce maintenance and increase worker safety by reducing their exposure to traffic.

- Worker Safety: Worker safety projects involve placing access gates in the freeway fences (allow parking and access from adjacent streets), vehicle pullouts and parking areas along freeways and/or modifications to irrigation systems with components in hazardous locations. It is anticipated that all worker safety projects can be completed before 2008. The planting rehabilitation projects will include any remaining worker safety type work when they are programmed.

- Freeze Damage: During 1990 some areas experienced extensive freeze damage *to vegetation* and most areas have not been replanted. Over the years the plant materials and root structure have rotted and are no longer protecting the slopes against soil erosion during rainfall. The Department has identified 1,100 acres needing replacement of ground cover planting material. All of the freeze damaged areas will be programmed before the end of the 2000-01 fiscal year.

- New Planting: There are fifteen locations that qualified for new landscaping prior to eligibility changes in 1987. These projects satisfy mitigation commitments which have been made to local agencies. The recommendation provides for funding these projects through the 2004-05 fiscal year.

- Mitigation Properties: As part of the implementation of some state highway projects, the Department has been required to provide mitigation for endangered species. We now own some mitigation properties that include maintenance responsibilities. These funds will be used for the costs involved to transfer ownership and maintenance responsibilities for these properties to agencies which are better prepared to provide for the long term maintenance responsibilities. There are a total of 23 separate mitigation parcels that should be transferred to qualified organizations. In San Diego County there are 10 sites with a combined area of over 700 acres. The Department may be able to transfer these 10 sites to other agencies during 1998. The remaining parcels will be transferred to other agencies before 2008.

SAFETY ROADSIDE REST AREA ELEMENT:

The state highway system includes 89 existing safety roadside rests, which attract over 90 million users annually. A majority of the rest areas were constructed in the mid-1960s and early 1970s. No new rest areas have been constructed since 1984. The Roadside Rest Area Master Plan includes seven new rest areas located primarily on major routes in rural areas. Statutes allow up to six rest areas to be constructed as part of a Joint Economic Development Demonstration Project.

The Department has attempted privatization and joint development of rest areas for over a decade without success. At least seven such projects have been attempted. Legal prohibitions; perceptions of unfair competition; opposition by rehabilitation agencies; and developer reluctance to incur the expense and regulation which accompanies government involvement, have made these efforts ineffective. Joint development interest should continue to be sought prior to development of any new rest area location. In the absence of such interest, state funding is proposed.

The Safety Roadside Rest element in the 10-Year SHOPP Roadside Rehabilitation component includes:

- Rest Area Rehabilitation:
  Projects include upgrading sewage capacity, water supplies and electrical systems to meet health and safety codes and to bring the facilities up to current CAL-OSHA

and ADA code requirements. Some rest areas need to be expanded in size to reduce the traffic congestion and related safety problems. In addition off and on ramps and parking areas are in need of rehabilitation work. All of the ADA deficiencies have been identified and recommendations are to fund these projects through the 2002-03 fiscal year. Other rest areas that have rehabilitation work, will include ADA work as part of that project and funding is recommended to be through the 2007-08 fiscal year to complete all of the rehabilitation needs.

- New Rest Areas:
  At the December 1997 CTC meeting, the 1985 Revised Initial System Master Plan was updated. During the meeting, seven rural rest areas were retained in the master plan and four proposed rest areas in urban and commercial locations were removed from the master plan. Emphasis remains focused on rural locations where few other safe stopping opportunities are available; and on the role of rest areas in enhancing the safety of California highways. Work will continue to develop sites using provisions for the joint economic development demonstration. In absence of joint development interests, state funding is proposed.

SUMMARY OF COSTS:

	6-Year Fund Estimate, Millions		10-Year Plan, Millions	
Roadside Rehab	Baseline	Recommendation	Baseline	Recommendation
Sprinkler Systems	*	$26	*	$49
Planting Rehab	$127	69	$220	120
Worker Safety	27	52	47	90
Freeze Damage	*	10	*	10
New Planting	*	12	*	14
Mitigation Properties	0	30	0	50
Rest Area Rehab	0	44	0	77
New Rest Areas	0	0	0	0
Totals	$154	$243	$267	$410
Increase over Baseline	0	$89	0	$143

* Included with Planting Rehabilitation

ECONOMIC BENEFITS:

The Roadside Rehabilitation economic benefits for the 10-year funding recommendation are estimated to be $0.8 billion which results in a benefit to cost ratio of 2:1. These benefits include: reduced maintenance cost, improved safety for workers and the public, reduced erosion, reduced water and herbicide use, and commitments to the public met to maintain existing landscape areas and safety road side rests.

Operations

Many types of operations projects are required to maintain and operate the state highway system. The projects provide a variety of benefits: reduced congestion at spot locations, improved traffic flow and safety; commercial vehicle enforcement facilities; compliance with code and statute requirements; and rehabilitation of maintenance stations, equipment shops and office buildings.

MANAGEMENT STRATEGY:

Goal: Better utilize existing highway facilities.
Non-capacity increasing operational improvements are designed to improve traffic conditions on the existing State highway system. The goal is to maintain or improve operational characteristics of existing highways in response to motorists needs. Projects are cost effective. On the average, benefits outweigh project costs by 3 to 1. Motorists benefit from travel time savings, and experience safer and more comfortable roadways. Cost effective projects will be identified and recommended for implementation.

Goal: Protect the state highway system from over weight and illegal loads.
Commercial vehicle enforcement facilities are placed at key locations on the state highway system. Benefits include:

- Legal Weight Enforcement - Overweight vehicles greatly accelerate the damage of highway pavement and result in greater rehabilitation costs. The current violation rate for overweight vehicles is about 2 percent.

- Safety Inspections - Commercial vehicles must pass a safety inspection in order to operate on public highways in California. These inspections are an important factor in reducing the number and severity of accidents involving commercial vehicles.

- Reduced Delay to Commercial Vehicles - Weigh-in-motion and automatic vehicle identification system technology being implemented will minimize delay time to commercial vehicles which are in compliance with weight limits and have recently passed a safety inspection.

- Traffic census data is collected for traffic monitoring systems, freight movement studies, truck weight cost allocation studies, pavement design, air quality planning and California Highway Patrol (CHP) enforcement strategies.

Goal: Implement land and building facilities consolidation studies.
Consolidation studies to improve efficiency and reduce costs have been completed for office, maintenance and equipment shop facilities.

Goal: Bring facilities up to current standards for seismic, safety, ADA and asbestos materials.

NON-CAPACITY INCREASING OPERATIONAL IMPROVEMENTS

ELEMENT:

Non-capacity increasing operational improvements involve making physical changes to the existing State highway system for the purpose of:

- Increasing level of service and improving traffic flow.
- Reducing traffic congestion and improving travel time.
- Making facilities safer and more comfortable for motorists.
- Correcting operational deficiencies that were unforeseen when the facility was originally
- designed and constructed.

These projects do not increase the design-capacity of the State highway system, but rather maintain or improve roadway characteristics commensurate with the safe, efficient movement of people, goods and services throughout the State. Projects are triggered by complaints from the general public, safety investigations, operational studies and investigations, and congestion monitoring. Once identified, projects are prioritized by combining a Delay Index with a modified Safety Index. Also considered are such factors as the number of passing opportunities on the route, roadway geometrics, the amount of commercial and recreational vehicle traffic, reduction in maintenance costs, local support, and continuity with other projects. The pool of potential candidate projects is growing. In 1996, the department identified almost 1,000 locations statewide where operational improvements may be needed over the next ten years.

COMMERCIAL VEHICLE ENFORCEMENT FACILITIES COMPONENT:

Commercial Vehicle Enforcement Facilities (weigh stations) protect highways from excessive damage to the pavements by overweight vehicles. Another important service conducted at weigh stations is safety inspections which reduce the number and severity of traffic accidents involving commercial vehicles. Currently, there are 53 weigh stations statewide and 58 mini sites (special turnouts for random enforcement using portable equipment). Weigh station needs include 11 new sites. The recommendation provides for funding two of these new sites every three years and for rehabilitation, operational improvements and weigh-in-motion facilities related to existing sites. While Caltrans provides the weigh station facilities, the CHP staff and operate the facilities. At some locations other state agencies perform their enforcement duties. These agencies include the Department of Motor Vehicles, Public Utilities Commission, Board of Equalization, Air Resources Board, and the Department of Food and Agriculture. By 2012, projected increases to California's external trade flows through major ports, from other states and Mexico are expected to result in a significant increase in truck volumes. Improvements for weigh stations are critical for handling these increased volumes.

LAND AND BUILDINGS ELEMENT:

The Land and Buildings Element provides funds for new facilities, consolidations and to bring existing facilities up to current requirements for seismic, safety, ADA and asbestos. Projects in the Land and Buildings element include:

- Office Facilities: These include the Department's Headquarters, District Offices and ancillary buildings, and material testing laboratories.
- Maintenance Facilities: The Department has maintenance facilities at 410 strategic locations throughout the state with plans for consolidation.
- Equipment Facilities: The Department operates 25 equipment shops used to repair and maintain a fleet of about 12,800 vehicles plus other equipment needed to maintain state highways.

Other projects included in the SHOPP Operations element are:

AMERICANS WITH DISABILITIES ACT (ADA) FACILITIES: By 1999-2000 the recommendation provides the funds to eliminate approximately 6,350 curb ramp barriers and provide accessible parking in park-and-ride lots.

HAZARDOUS WASTE: By 1999-2000 the recommendation provides the funds to cleanup hazardous materials identified at locations that are not related to an ongoing or programmed construction project.

LIGHTING UPGRADES: By 1999-2000 the recommendation provides the funds to replace obsolete illumination facilities which will result in an energy savings and will provide facilities that can be maintained. Often repair parts are not available for the obsolete facilities.

SUMMARY OF COSTS:

	6-Year Fund Estimate, Millions		10-Year Plan, Millions	
Operations	Baseline	Recommendation	Baseline	Recommendation
Operational Improvements	$190	$237	$354	$412
Weigh Stations	93	95	161	166
Land & Buildings	190	258	330	446
Americans With Disabilities	8	8	8	8
Hazardous Waste	10	10	10	10
Lighting Upgrades	12	12	12	12
Totals	$503	$620	$875	$1,054
Increase over Baseline	0	$117	0	$179

ECONOMIC BENEFITS:

The Operations economic benefits for the 10-year funding recommendation are estimated to be $3.4 billion, resulting in a benefit to cost ratio of 3:1. The major components of these benefits are operational improvements which have at least a 3:1 benefit cost ratio ($1.2 billion) and weigh station projects that over the 10-Year fund recommendation period reduce damage to highway pavements caused by overweight vehicles ($1.7 billion). The remaining $0.5 billion in benefits is for Lands and Buildings and other work required to operate the State highway system.

Strategies to Control Cost and Improve Efficiency

Several quality team efforts are underway which have are expected to identify new business practices and methods to control costs and improve efficiency. Additionally, the development of this 10-Year SHOPP Rehabilitation Plan provides the framework to develop more detailed plans for the various program components. Some of these efforts will provide benefits for projects programmed in both the STIP and SHOPP.

NEW MANAGEMENT INFORMATION SYSTEMS

Pavement Management System

The department has a contract with Woodward-Clyde Consultants to develop a "state-of-the-art" Pavement Management System. The schedule calls for delivery of this new software late-1998, and the department will be loading data and testing its capabilities during 1998. This system will include the following capabilities: network policy recommendations, pavement performance prediction model, project selection and total cost minimization, and tracking of performance goal achievements. The department has been in contact with other large states, and none have a pavement management system with all of these features. It is expected that this system will assist in making decisions regarding pavement rehabilitation strategies, and improve efficiency by identifying rehabilitation projects at an optimum time to make efficient use of support and capital resources.

Bridge Management System

The department has a relatively new bridge management system known as PONTIS. This system has the ability to: predict deterioration, forecast future needs, assess and quantify impacts of constrained budgets, and prioritize work using optima benefit/cost. PONTIS will be a very valuable tool in providing information for optimizing the use of resources.

Traffic Safety Program Management

Additional emphasis is planned for safety investigations and improvements to program procedures. A new status/tracking system for locations needing improvement will be developed. These improvements assist in the overall management of the program.

Engineering Resources

The department is using XPM to develop project work plans which provide a schedule of milestones and support needs for major projects on the state highway system. This information will be utilized to develop information included in the department's annual Budget Request.

Traffic Operations Management

The Traffic Operations Program is currently in the process of developing specific performance measures for State highway routes. These performance measures are being devised to increase uniformity of analysis and improve the project selection and prioritization process from a statewide perspective.

QUALITY TEAMS

SHOPP Re-engineering

The department has a pilot program underway in three districts. The project implementation teams will develop about $25 million of SHOPP type projects using new processes and delegated decision making. The goals for this quality effort were to reduce the engineering costs by 50% and reduce the overall time from project identification to completion of construction by 50%. The contracts developed by these teams will begin their construction phase during the 1997-98 fiscal year. A detailed evaluation of the new procedures will compare the traditional methods, time-line, and costs. It is believed that a new way of doing business for the less complex highway projects will emerge from this effort.

Environmental Documents

An environmental document quality team comprised of Caltrans staff from district and corporate functional units has been chartered to improve the content and quality of environmental documents. With input from staff at the Federal Highway Administration, the team has identified several improvements in the existing environmental process, which will result in efficiencies in the development and processing of documents. Among the recommendations for implementation are: peer review of documents, greater utilization of computer technology to disseminate information, earlier review of documents by legal staff, formation of environmental document preparation teams, development of an advisory council to provide technical assistance, and development of an environmental academy to better address and focus on training, staff development, and continuing education needs. The benefits will be a more timely, comprehensive document that responds to the issues in a format understandable by the public.

Highway Planting

The Office of State Landscape Architecture is sponsoring a quality team than includes representatives from Design, Construction and Office Engineer. The goal is to reduce the cost of engineering by 50% for highway planting projects. The team will look at existing standard plan development practices and determine areas where design effort can be reduced without affecting the quality of the project. A Design-Build pilot project will be considered in the team's discussion as a new way of doing business for smaller projects. A meeting is scheduled with Landscape Contractors to discuss quality improvement concepts for Caltrans Highway Planting projects. Their input will be used in the quality team analysis for cost reduction. Changes will only be implemented if there is a net savings to the projects.

Priority Process for Non-Capacity Increasing Operational Improvements

A quality team is currently in the conceptual stage. It is anticipated that the team will be charged with making recommendations for improving the project selection and prioritization process in reaction to Senate Bill 45 (Statutes of 1997) that eliminated the Traffic Systems Management Program. These projects will now have to compete in the SHOPP against an already growing list of potential candidate projects. This accentuates the need for a project selection process that ensures that only the best projects are proposed for funding.

PROJECT SCOPE, COST AND SCHEDULE MANAGEMENT PROCEDURES

Since 1992, the department has utilized a formal process to obtain Deputy-level approvals to changes in a project's scope, cost or schedule change. At the same time the following management objectives were established:

- Deliver 90% of the total number of programmed projects so they are ready to advertise in the programmed year.
- Deliver 100% of the programmed dollars for the program year by using the mid cycle SHOPP revision reservation dollars to advance projects and backfill projects that have been delayed due to scheduling problems.
- Deliver projects for no more than the programmed funds.

These procedures resulted in significant improvements to project cost control and overall program delivery. It is intended to continue this formal process as a part of the project management procedures within the department.

Pavement Distress on Class 1 Routes

LEGEND

Class 1 Routes

Pavement Distress - Rough ride and/or Structural damage

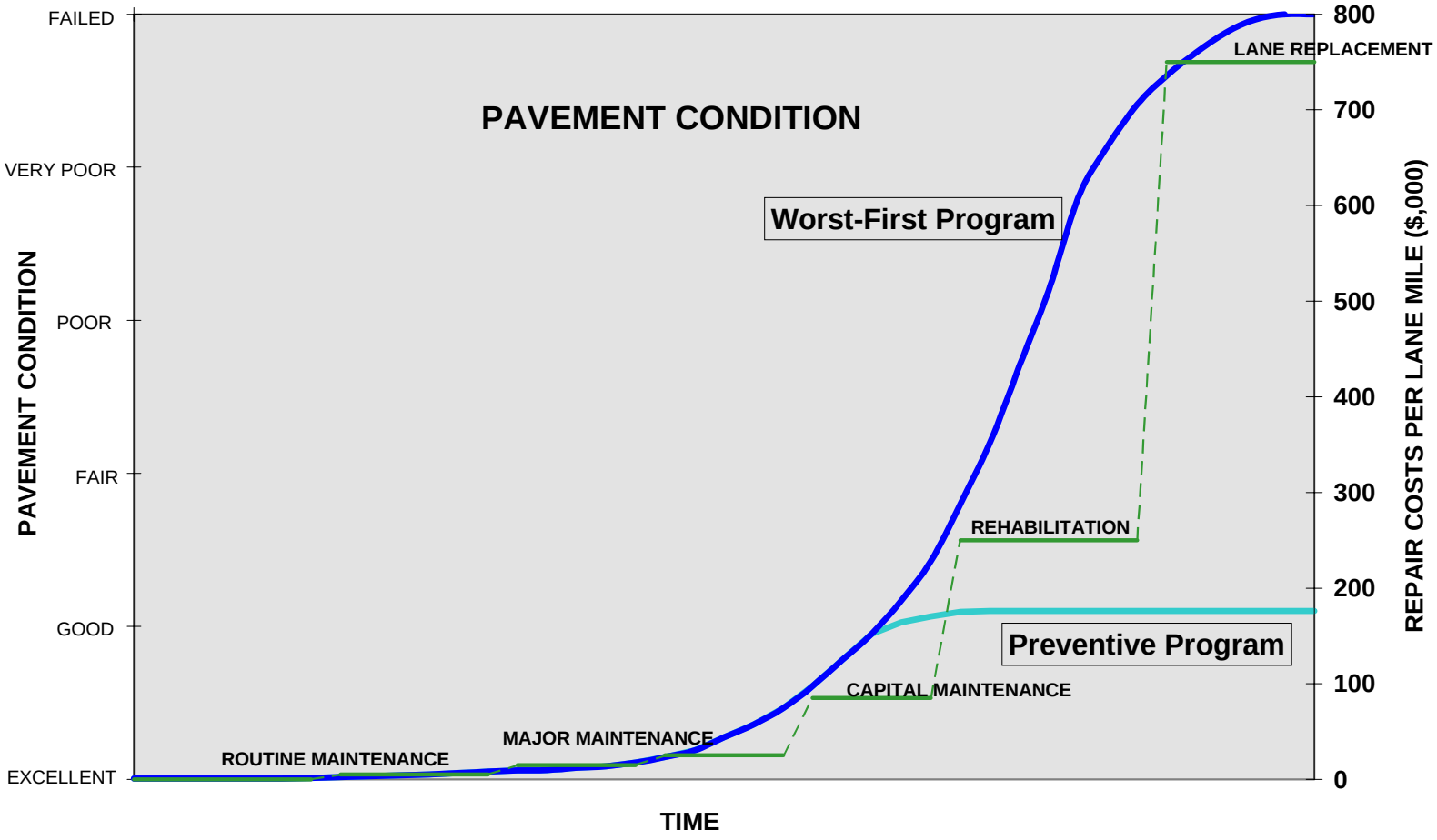
NO SCALE 01/97

Note:

Class 1- Class 1 routes are rural principal arterial highways and their extensions into urbanized areas. Annual average daily traffic (AADT) of over 5,000 vehicles per day. Includes interstate highways and major freeways.

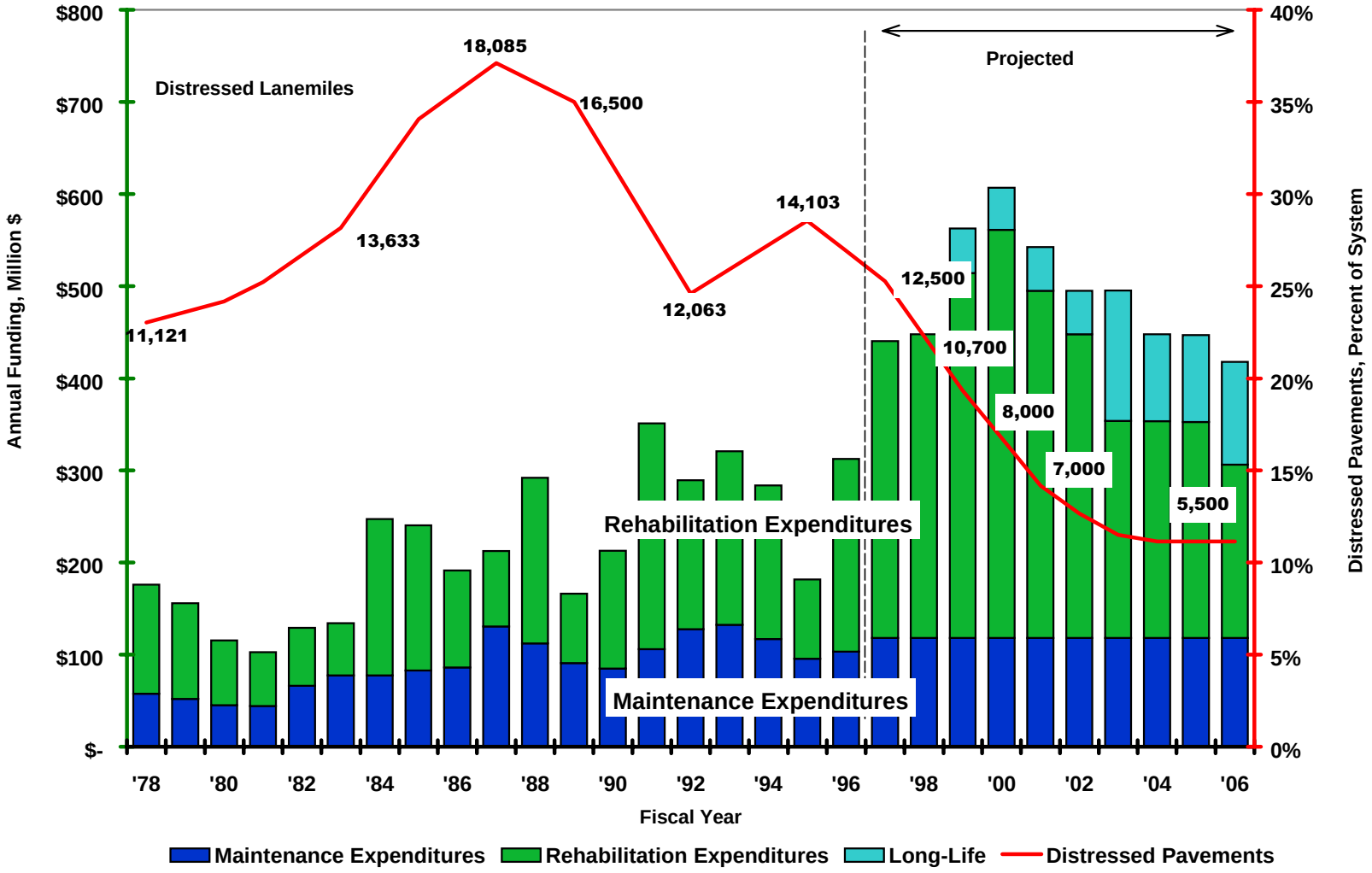
Caltrans

Pavement Condition vs. Costs of Repair



Maintaining pavements in good to excellent condition requires frequent, low-cost treatments.

Recommended Option 'A',
Highway Maintenance & Rehabilitation Programs Expenditures and Distress,
1978-2005, 1996 dollars



1996 Baseline

Dollars in Millions

Program	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	6-Yr 98-04 Total	10-Yr 98-08 Total	
SAFETY													
Traffic Safety & CURE	$49	$51	$54	$56	$50	$50	$52	$54	$54	$56	$312	$528	
Median Barriers	5	5	5	5	6	6	6	7	7	7	32	59	
Total	$54	$56	$59	$61	$56	$58	$58	$61	$61	$63	$344	$587	8%
ROADWAY REHABILITATION													
Pavement Rehab	$332	$355	$368	$373	$384	$392	$401	$410	$419	$432	$2,204	$3,866	
Bridge Rehab	61	83	115	154	196	200	205	210	214	220	809	1,658	
Total	$393	$438	$483	$527	$580	$592	$606	$620	$633	$652	$3,013	$5,524	76%
ROADSIDE REHABILITATION													
Landscape	$20	$21	$21	$21	$22	$22	$23	$23	$23	$24	$127	$220	
Worker Safety	4	4	4	5	5	5	5	5	5	5	27	47	
Rest Area Rehabilitation	0	0	0	0	0	0	0	0	0	0	0	0	
Total	$24	$25	$25	$26	$27	$27	$28	$28	$28	$29	$154	$267	4%
OPERATIONS													
Operational Improvements	$20	$21	$36	$37	$38	$38	$40	$39	$42	$43	$190	$354	
Weigh Stations	15	15	16	16	15	16	16	17	17	18	93	161	
Lands & Buildings	30	31	31	32	33	33	34	35	35	36	190	330	
Americans With Disabilities	4	4	0	0	0	0	0	0	0	0	8	8	
Hazardous Waste	5	5	0	0	0	0	0	0	0	0	10	10	
Lighting Upgrades	6	6	0	0	0	0	0	0	0	0	12	12	
Total	$80	$82	$83	$85	$86	$87	$90	$91	$94	$97	$503	$875	12%
1996 Baseline Total	$551	$601	$650	$699	$749	$764	$782	$800	$816	$841	$4,014	$7,253	100%

Note: Dollars escalated at 2.2% per year

Attachment 4

Department's Recommendation

Dollars in Millions

Program	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	6-Yr 98-04 Total	10-Yr 98-08 Total	
SAFETY													
Traffic Safety	$24	$25	$25	$26	$27	$27	$28	$29	$29	$30	$154	$270	
Median Barriers	15	15	17	16	16	17	17	17	17	18	96	165	
2&3 Lane Roads	11	11	11	11	11	10	10	10	10	11	65	106	
CURE	15	15	15	15	14	10	9	9	8	8	84	118	
Total	$65	$66	$68	$68	$68	$64	$64	$65	$64	$67	$399	$659	8%
ROADWAY REHABILITATION													
Pavement Rehab	$424	$490	$420	$382	$278	$282	$289	$243	$243	$248	$2,276	$3,299	
Long Life Pavement	53	50	54	54	167	115	116	141	149	152	493	1,051	
Bridge Rehab	97	103	138	173	211	249	290	296	302	308	971	2,167	
Total	$574	$643	$612	$609	$656	$646	$695	$680	$694	$708	$3,740	$6,517	75%
ROADSIDE REHABILITATION													
Sprinkler Systems	$4	$4	$4	$4	$5	$5	$5	$6	$6	$6	$26	$49	
Planting Rehabilitation	11	11	12	12	11	12	12	13	13	13	69	120	
Worker Safety	8	8	9	9	9	9	9	9	10	10	52	90	
Freeze Damage	2	2	2	2	2	0	0	0	0	0	10	10	
New Planting	2	2	2	2	2	2	2	0	0	0	12	14	
Mitigation Properties	5	5	5	5	5	5	5	5	5	5	30	50	
Rest Area Rehabilitation	7	7	7	7	8	8	8	8	8	9	44	77	
Total	$39	$39	$41	$41	$42	$41	$41	$41	$42	$43	$243	$410	5%
OPERATIONS													
Operational Improvements	$37	$38	$38	$40	$41	$43	$44	$46	$42	$43	$237	$412	
Weigh Stations	15	15	16	16	16	17	17	18	18	18	95	166	
Lands & Buildings	41	42	42	43	44	46	46	47	47	48	258	446	
Americans With Disabilities	5	3	0	0	0	0	0	0	0	0	8	8	
Hazardous Waste	5	5	0	0	0	0	0	0	0	0	10	10	
Lighting Upgrades	6	6	0	0	0	0	0	0	0	0	12	12	
Total	$109	$109	$96	$99	$101	$106	$107	$111	$107	$109	$620	$1,054	12%
SHOPP Total	$787	$857	$817	$817	$867	$857	$907	$897	$907	$927	$5,002	$8,640	100%
1996 Baseline Total	$551	$601	$650	$699	$749	$764	$782	$800	$816	$841	$4,014	$7,253	
Increase from Baseline	$236	$256	$167	$118	$118	$93	$125	$97	$91	$86	$988	$1,387	

Note: Dollars escallated at 2.2% per year

Attachment 5